

Deluxe Single-Mode or Multimode Light Source

Works with an optical power meter to test optical fiber cables for optical loss.

FOLS-SM-200 switches between 1310 and 1550 nm.
FOLS-MM-200 switches between 850 and 1300 nm.



**Customer
Support
Information**

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500) • FREE technical support 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746 • Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018 • Web site: www.blackbox.com • E-mail: info@blackbox.com

FEDERAL COMMUNICATIONS COMMISSION AND
INDUSTRY CANADA RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

Normas Oficiales Mexicanas (NOM)
Electrical Safety Statement
INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

A: El cable de poder o el contacto ha sido dañado; u

B: Objetos han caído o líquido ha sido derramado dentro del aparato; o

C: El aparato ha sido expuesto a la lluvia; o

D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

E: El aparato ha sido tirado o su cubierta ha sido dañada.

SAFETY INFORMATION

WARNING: Never look directly into optical outputs or a fiber while the equipment is on. Invisible and visible laser beams may damage your eyes.

Do not short-circuit the AC adapter/charger terminal and the batteries. Excessive electrical current may cause personal injury due to fumes, electric shock, or equipment damage.

Connect the AC power cord to the equipment and wall socket properly. When you insert the AC plug, make sure there is no dust or dirt on the terminals and both plugs are fully seated.

WARNING: If the AC plug is not connected properly, fuming, electric shock, or equipment damage might occur and may result in personal injury.

Do not operate the equipment near hot objects, in hot environments, in dusty/humid atmospheres, or when condensation is present on the equipment. This may cause electric shock, product malfunction, or poor performance.

TRADEMARKS USED IN THIS MANUAL

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Deluxe Single-Mode or Multimode Light Source

1. Specifications

1.1 Optical Specifications

Auto-Power Off: Yes

Backlighting: Yes

Central Wavelength: FOLS-SM-200: 1310 \pm 20 nm, 1550 \pm 20 nm;
FOLS-MM-200: 850 \pm 10 nm, 1300 \pm 20 nm

Emitter Type: LD (laser diode)

Laser: Class 1

Output Frequency: 270 Hz, 1 kHz, 2 kHz

Output Power: -5.0 dBm \pm 1 dB

Output Stability (15 min. Preheat @ 77° F [25° C]):

Short-term (15 minutes): \pm 0.05 dB/15 min. @ 1300, 1310, 1550 nm
 \pm 0.1 dB/15 min. @ 850 nm;

Long-term: (5 hours): \pm 0.1 dB/5 hr. @ 1300, 1310, 1550 nm;
 \pm 0.2 dB/5 hr. @ 850 nm

Output Wavelength (nm): FOLS-SM-200: 1310 and 1550 nm;
FOLS-MM-200: 850 and 1300 nm

Spectral Width: 5 nm typical

Connectors: FC/PC (SC/PC, ST/PC interchangeable connectors optional)

1.2 General Specifications

Temperature Tolerance: Operating: +14 to +122° F (-10 to +50° C);
Storage: -4 to +155° F (-20 to +70° C)

Humidity Tolerance: Less than 90%

Power: (2) Ni-MH (AA) rechargeable batteries, AC adapter

Size: 6.3"H x 3"W x 1.8"D (16 x 7.6 x 4.5 cm)

Weight: Including batteries: 0.59 lb. (0.26 kg)

2. Overview

2.1 Introduction

The Deluxe Single Mode Light Source and the Deluxe Multimode Light Source are optical laser sources. Use a light source to test long-distance segments of single-mode or multimode optical fiber. The light sources also work with our Deluxe Optical Power Meter (FOPM-200) or Deluxe Optical Power Meter with Memory (FOPM-210) to measure optical fiber loss.

2.2 What's Included

Your package should include the following items. If anything is missing or damaged, contact Black Box Technical Support at 724-746-5500.

- Main unit
- Carrying case
- (2) Ni-MH (AA) rechargeable batteries
- AC adapter
- Small Phillips screwdriver
- FC/PC connector (SC/PC, ST/PC interchangeable connectors optional)
- User's manual on CD-ROM
- A printed Quick Start Guide
- Quality check report

2.3 Features

- Small, compact unit is lightweight and is easy to carry.
- Shifts units automatically, also has auto-off, power capacity display, and recharging display on the LCD.
- LED backlighting for easy operation in dark environments.

3. Operation

3.1 Discharged Batteries

A battery indicator on the screen shows the remaining charge. See Figures 3-1 and 3-2. Table 3-1 describes the LED status.

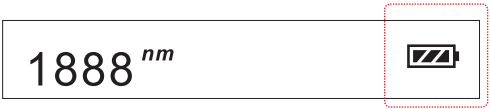


Figure 3-1. Battery indicator full.

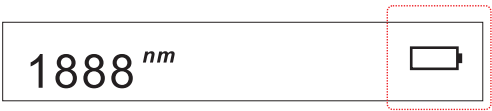


Figure 3-2. Battery indicator empty.

Table 3-1. Battery indicator status.

Status	Icon	Description
Full		Battery at 100% capacity
2 Bars		Battery at 50–75% capacity
1 Bar		Battery at 25–50% capacity
Empty		Battery at 0–25% capacity The battery icon flashes when the power is almost depleted. Connect the AC adapter to the light source to recharge the battery.

NOTES: The AC indicator is not displayed when power is supplied by battery.

To eliminate the possibility of acid leakage, remove the battery if you won't use the light source for an extended time.

To replace the batteries, use 2450 Ni-MH rechargeable AA batteries.

3.2 AC Operation

If you will use the light source at one location, for example, in a laboratory or test department, you can use the AC adapter to power it instead of batteries. Plug the AC adapter's output cable into the DC input jack on the light source's bottom side. When the AC adapter is plugged in, the AC indicator on the LCD will be displayed. See Figure 3-3.

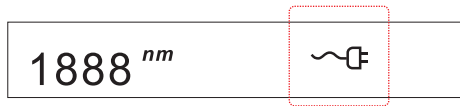


Figure 3-3. AC adapter indicator.

NOTES: Power is supplied by the AC adapter when plugged in even if the battery is installed. The battery indicator does not display on the screen.

Make sure that the operating voltage is within the range of the local AC voltage. For example, input: AC 100-240 V, 50-60 Hz.

4. Using the Deluxe Single-Mode or Multimode Light Source

4.1 Display and Controls









Figure 4-1. Keypad functions: Numbers 1 through 6.

4.1.1 Keypad

Use the keypad to access light source functions. See Table 4-1.

Table 4-1. Keypad functions.

Number	Key	Function
1		Press to set the wavelength. Select from two wavelengths: 850 and 1300 nm (FOLS-MM-200) or 1310 and 1550 nm (FOLS-SM-200).
2		Press to select output frequency. Select from CW (Continuous Wave), 270 Hz, 1 kHz, and 2 kHz.
3		Output power adjustment. Increase or decrease the output power by 0.1 dB increments. The adjustable range is -2 to -8 dBm.
4		Press to turn Auto-Wavelength recognition on/off. TWIN: on/SINGLE: off.
5		Press to switch backlighting on/off.
6		Switches the light source on/off. Press and hold for more than two seconds while turning on to disable the auto-off feature.

4.1.2 Back and Top

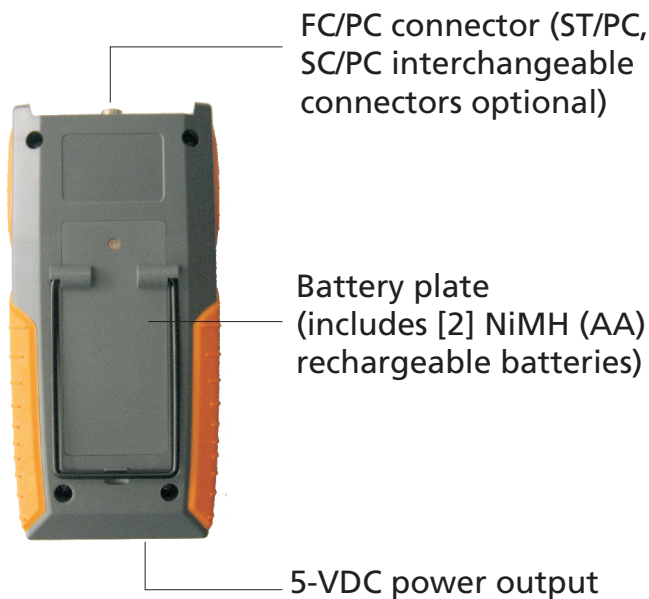


Figure 4-2. Deluxe Single-mode or Multimode Light Source, back view.

4.1.3 LCD

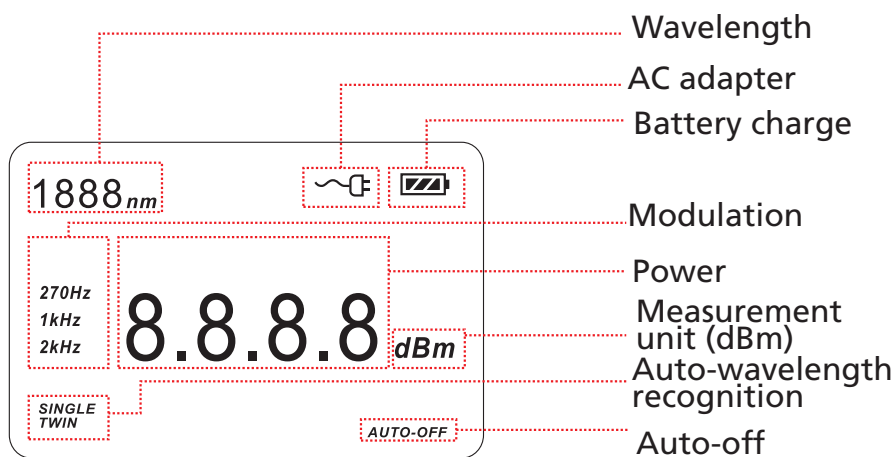




Figure 4-3. LCD

4.2 Turning the Light Source On and Off


1. Press the  key briefly. The light source powers on. See Figure 4-4.



Figure 4-4. Light source powered on/off.

2. Press the  key briefly again. The light source powers off.
3. Turn on/off the auto-off function. The power meter powers off automatically if you do not press a key within 10 minutes. Press the  key for about 2 seconds to deactivate the auto-off function and the indicator will disappear on the LCD.

4.3 Switching the Wavelength

Press the  key repeatedly until the desired wavelength displays. Select from two possible wavelengths: FOLS-MM-200: 850 and 1300 nm; FOLS-SM-200: 1310 and 1550 nm. See Figure 4-5.

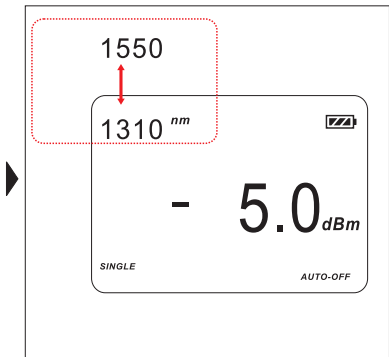


Figure 4-5. Switching wavelength.

4.4 Frequency Output

1. The light source defaults to CW when it switches on. When it is set to CW, no frequency appears on the display.
2. Press the **CW/Hz** key to select the output from 270 Hz, 1 kHz, and 2 kHz. See Figure 4-6.

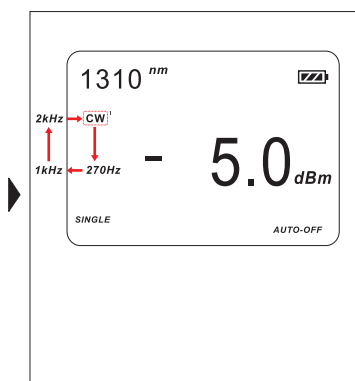




Figure 4-6. Selecting output.

4.5 Auto-Wavelength Recognition

Press the **TWIN** key to turn on and off the wavelength recognition function.

4.6 Switching LCD Backlighting On and Off

1. Press the  key. (See Figure 4-7.) Backlighting switches on.
2. Press the  key again. Backlighting switches off.

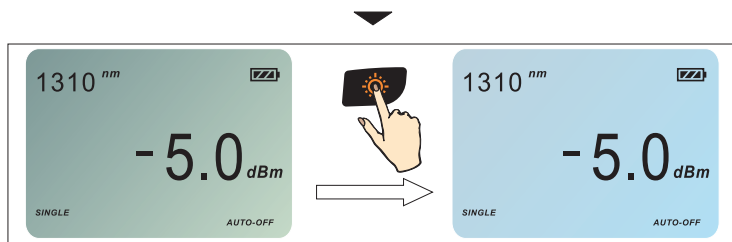



Figure 4-7. Switching backlighting on and off.

4.7 Setting the Output Power

Press the  key to increase output power. This measurement ranges from -2 dBm to -8 dBm. Each time you press the key, the value increases by 0.1 dBm.

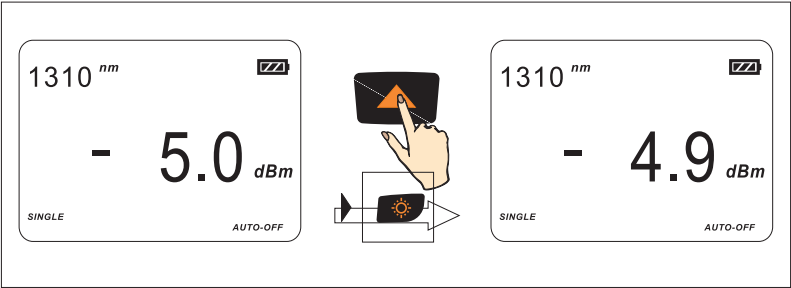



Figure 4-8. Increase output power.

Press the  key to decrease output power. This measurement ranges from -2 dBm to -8 dBm. Each time you press the key, the value decreases by 0.1 dBm.

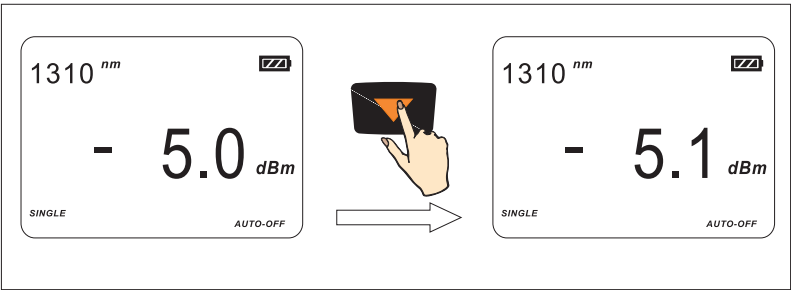


Figure 4-9. Decrease output power.

4.8 Connecting to the Optical Power Meter

When connected to the optical power meter, the light source accurately measures the fiber loss at distances up to more than 250 kilometers at 1550 nm. On-the-spot measurements will differ with the working wavelength, fiber attenuation, and the testing environment.

5. Maintenance

Disconnect the AC adapter/charger and replace the protective dust cap once you finish using it.

Clean the connector and the instrument when they get dirty from use. We recommend using optical cleaning pads and anhydrous alcohol. Be careful not to get liquid inside the instrument.

Appendix. Troubleshooting

A.1 Calling Black Box

If you determine that your Deluxe Single-Mode or Multimode Light Source is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

A.2 Shipping and Packaging

If you need to transport or ship your Deluxe Single-Mode or Multimode Light Source:

- Package it carefully. We recommend that you use the original container.
- If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, contact Black Box to get a Return Authorization (RA) number.

Three-Year Limited Warranty

Products are warranted against the defective components and workmanship
Three-Year Limited Warranty

Products are warranted against defective components and workmanship for three for a period of three years from the date of delivery to the original customer. Any product found to be defective within the warranty period can be returned to an authorized service center for repair, replacement, and calibration.

Exclusions

The warranty on your equipment shall not apply to defects resulting from the following: unauthorized repair or modification, misuse, negligence, or accident.

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